## REMARKS

Claims 47-58 are pending in the present application and at issue. Claims 46 and 47 have been amended to address the rejection under 35 U.S.C. 112.

It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

### I. The Rejection of Claims 47-58 under 35 U.S.C. 112

Claims 47-58 are rejected under 35 U.S.C. 112, first paragraph, because "No basis or support is found in the present specification for a haloperoxidase concentration of 0.01-100 mM."

Claims 47 and 48 have amended to recite the haloperoxidase concentration disclosed at page 6, lines 10-14 of the specification. Applicants therefore submit that this rejection has been overcome.

### II. The Rejection of Claims 47-58 under 35 U.S.C. 103

The Office maintained the rejection of claims 47-58 under 35 U.S.C. 103 as being unpatentable over Allen (U.S. Patent No. 5,389,369) taken with Winkler et al. (U.S. Patent No. 5,928,380) and Cantor et al. (U.S. Patent No. 3,539,520). This rejection is respectfully traversed.

Allen discloses methods and compositions for killing or inhibiting the growth of yeast or sporular microorganisms comprising contacting the microorganisms, with a haloperoxidase, a peroxide, a halide source and at least one antimicrobial activity enhancing agent. Suitable antimicrobial activity enhancing agents are certain alpha-amino acids, which are not salts of $NH_4^+$.

Winkler et al. disclose a method of treating undyed fabric, garment or yarn in an aqueous medium with a composition comprising an effective amount of a haloperoxidase, a halide source and a hydrogen peroxide source. The treated fabric is said to have improved shrink-resistance. Winkler et al. further disclose that the composition may comprise to maintain a suitable pH for the haloperoxidase used (column 5, lines 47-50). Winkler et al. further disclose a laundry list of buffers, one of which is ammonium carbonate. However, Winkler et al. do not contain any working examples of the combination of haloperoxidase and ammonium carbonate. Moreover, Winkler et al. do not teach or suggest the use of haloperoxidases for killing or inhibiting the growth of microorganisms.

Cantor et al. disclose detergent sanitizing compositions containing germicidal quaternary ammonium germicides in combination with a limited class of block polymer nonionic detergents

(col. 2, lines 40-50). All of the germicidal compounds are quarternary ammonium compounds which contain four alkyl and/or aryl groups. However, Cantor et al. do not teach or suggest the use of salts of $NH_4^+$, i.e., a nitrogen atom attached to four hydrogen atoms. Moreover, since salts of $NH_4^+$ are not germicidal compounds, it is improper to combine Cantor et al. with the other references.

Thus, none of the cited references, alone or in combination, teaches or suggests methods and compositions for killing or inhibiting the growth of microorganisms using a haloperoxidase and a salt of $NH_4^+$, as claimed herein. Moreover, none of the cited references, alone or in combination, teaches or suggests the preferred halide sources and ammonium salts recited in the dependent claims.

Moreover, none of the cited references suggest that the combination of a haloperoxidase and a salt of $NH_4^+$ would result in an increased antibacterial activity. These results are surprising and unexpected.

The Office states that "Even though Winkler may not recognize that ammonium salts enhance the antimicrobial activity of a haloperoxidase. However, this is an intrinsic property or effect, such that it occurs whenever the combination is used." This is respectfully traversed.

None of the cited references, including Winkler et al., discloses any working examples of the combination of a haloperoxidase and a salt of $NH_4^+$. Thus, Applicants' surprising and unexpected results are not an intrinsic property or effect of the disclosure of Winkler et al. Furthermore, as stated above, Winkler et al. disclose only one salt of $NH_4^+$ in a laundry list of possible buffers. Thus, Winkler et al. do not suggest that there is any advantage to using the salt of $NH_4^+$ over any of the other buffers in the laundry list.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

## III. Conclusion

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

Date: September 3, 2003

Elias J. Lambiris, Reg. No. 33,728
Novozymes North America, Inc.
500 Fifth Avenue, Suite 1600
New York, NY 10110
(212) 840-0097

**AMENDMENTS TO THE CLAIMS:**

Claims 47 and 48 are amended. The following is the status of the claims of the above-captioned application, as amended.

Claim 47 (Currently amended). A method of killing or inhibiting the growth of microorganisms, comprising contacting the microorganisms with a composition comprising (a) a haloperoxidase at a concentration in the range of 0.01-100 ~~mM~~ mg enzyme protein per liter, (b) a hydrogen peroxide source at a concentration in the range of 0.01-1000 mM, (c) a halide source at a concentration in the range of 0.01-1000 mM, and (d) a salt of $NH_4^+$ at a concentration in the range of 0.01-1000 mM.

Claim 48 (Currently amended). The method of claim 47, wherein the concentration of the haloperoxidase is in the range of 0.05-50 ~~mM~~ mg enzyme protein per liter, the concentration of the halide source is 0.05-500 mM, and the concentration of the salt of $NH_4^+$ is 0.05-500 mM.

Claim 49 (Previously presented). The method of claim 47, wherein the haloperoxidase is a vanadium haloperoxidase.

Claim 50 (Previously presented). The method of claim 47, wherein the haloperoxidase is a chloride peroxidase or a bromide peroxidase.

Claim 51 (Previously presented). The method of claim 47, wherein the source of hydrogen peroxide is hydrogen peroxide, a hydrogen peroxide precursor, a hydrogen peroxide generating enzyme system, or a peroxycarboxylic acid or a salt thereof.

Claim 52 (Previously presented). The method of claim 47, wherein the halide source is a halide salt.

Claim 53 (Previously presented). The method of claim 52, wherein the halide source is potassium bromide, potassium chloride, potassium iodide, sodium bromide, sodium chloride, or sodium iodide.

Claim 54 (Previously presented). The method of claim 47, wherein the salt of $NH_4^+$ is diammonium sulphate, ammonium chloride, ammonium bromide, or ammonium iodide.

Claim 55 (Previously presented). The method of claim 47, wherein the halide source is sodium chloride and the ammonium salt is diammonium sulphate.

Claim 56 (Previously presented). The method of claim 47, wherein the halide source and the salt of $NH_4^+$ are the same.

Claim 57 (Previously presented). The method of claim 47, wherein said composition is an aqueous composition.

Claim 58 (Previously presented). The method of claim 47, wherein the composition is a granulate.